II. AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior listings, or versions, of claims.

1. (Currently Amended) A method for simulating transient conditions in a circuit using a piecewise constant model, the method comprising the steps of:

evaluating an error criteria to determine a maximum allowable change in one of a current and a voltage; ~~and~~

simulating the transient conditions by implementing an adaptive step in the piecewise constant model according to the maximum allowable change; and

analyzing the circuit based on a result of the simulating.

2. (Original) The method of claim 1, wherein the evaluating step includes replacing a plurality of predefined steps of the piecewise constant model.

3. (Original) The method of claim 1, wherein the error criteria is based on an approximate relative timing error.

4. (Original) The method of claim 1, wherein the evaluating step executes dynamically during the simulating step.

5. (Original) The method of claim 1, wherein the evaluating step executes prior to the simulating step.

6. (Original) The method of claim 1, further comprising the step of rejecting the adaptive step in the case that a derivative voltage across a circuit element of interest reverses.

7. (Original) The method of claim 1, wherein a plurality of adaptive steps are implemented, and further comprising the step of limiting the number of adaptive steps.

8. (Original) The method of claim 1, wherein the evaluating step includes rendering the adaptive step at an average value of the maximum allowable change.

9. (Currently Amended) A method for simulating transient conditions in a circuit using a piecewise constant model including a plurality of steps, the method comprising the steps of:

replacing a plurality of first steps in the piecewise constant model with a lesser number of second steps to address an error criteria; ~~and~~

simulating the transient conditions using the piecewise constant model including the lesser number of second steps; and

analyzing the circuit based on a result of the simulating.

10. (Original) The method of claim 9, wherein the replacing step includes determining a maximum allowable change in one of a current and a voltage, and implementing the second steps in the piecewise constant model according to the maximum allowable change.

11. (Original) The method of claim 9, wherein the error criteria is based on an approximate relative timing error.

12. (Original) The method of claim 9, further comprising the step of rejecting the second step in the case that a derivative voltage across a circuit element of interest reverses.

13. (Original) The method of claim 9, wherein the replacing step executes dynamically during the simulating step.

14. (Original) The method of claim 9, wherein the replacing step executes prior to the simulating step.

15. (Original) The method of claim 9, further comprising the step of limiting the number of second steps.

16. (Original) The method of claim 9, wherein the replacing step includes rendering the step at an average value of the maximum allowable change.

17. (Currently Amended) A computer program product comprising a computer useable medium having computer readable program code embodied therein for simulating transients conditions in a circuit using a piecewise constant model, the program product comprising program code which, when executed by a computer system, enables the computer system to:

~~program code configured to~~ evaluate an error criteria to determine a maximum allowable change in one of a current and a voltage; ~~and~~

~~program code configured to~~ simulate the transient conditions by implementing an adaptive step in the piecewise constant model according to the maximum allowable change; and

analyze the circuit based on a result of the simulation.

18. (Original) The program product of claim 17, wherein the simulating program code replaces a plurality of predefined steps of the piecewise constant model.

19. (Original) The program product of claim 17, wherein the error criteria is based on an approximate relative timing error.

20. (Original) The program product of claim 17, wherein the evaluating program code executes dynamically during execution of the simulating program code.

21. (Original) The program product of claim 17, wherein the evaluating program code executes prior to the simulating program code.

22. (Original) The program product of claim 17, further comprising program code configured to reject the adaptive step in the case that a derivative voltage across a circuit element of interest reverses.

23. (Original) The program product of claim 17, wherein a plurality of adaptive steps are implemented, and further comprising program code configured to limit the number of adaptive steps.

24. (Original) The program product of claim 17, wherein the evaluating program code renders the adaptive step at an average value of the maximum allowable change.

25. (Currently Amended) A system for simulating transient conditions in a circuit using a piecewise constant model, the system comprising:

means for evaluating an error criteria to determine a maximum allowable change in one of a current and a voltage; ~~and~~

means for simulating the transient conditions by implementing an adaptive step in the piecewise constant model according to the maximum allowable change; and

means for analyzing the circuit based on a result of the simulating.

26. (Original) The system of claim 25, wherein the evaluating means executes dynamically during execution of the simulating means.

27. (Original) The system of claim 25, wherein the evaluating means executes prior to execution of the simulating means.

28. (Original) The system of claim 25, further comprising means for rejecting the adaptive step in the case that a derivative voltage across a circuit element of interest reverses.

29. (Original) The system of claim 25, wherein a plurality of adaptive steps are implemented, and further comprising means for limiting the number of adaptive steps.

30. (Original) The system of claim 25, wherein the evaluating means includes means for rendering the adaptive step at an average value of the maximum allowable change.